KPMG Consulting

Logical Decisions® for Windows

Structural Overview and Demonstration

June 2002

Note: Logical Decisions® for Windows (LDW) is a product of Logical Decisions, based in Englewood, CO. It is not a product of KPMG Consulting.

Structural Overview and Demonstration

KPMG Consulting

Presentation Contents:

- Review of PPS Model Structure
- Logical Decisions Model Structure
- High-Level Process Comparison: PPS vs. Logical Decisions

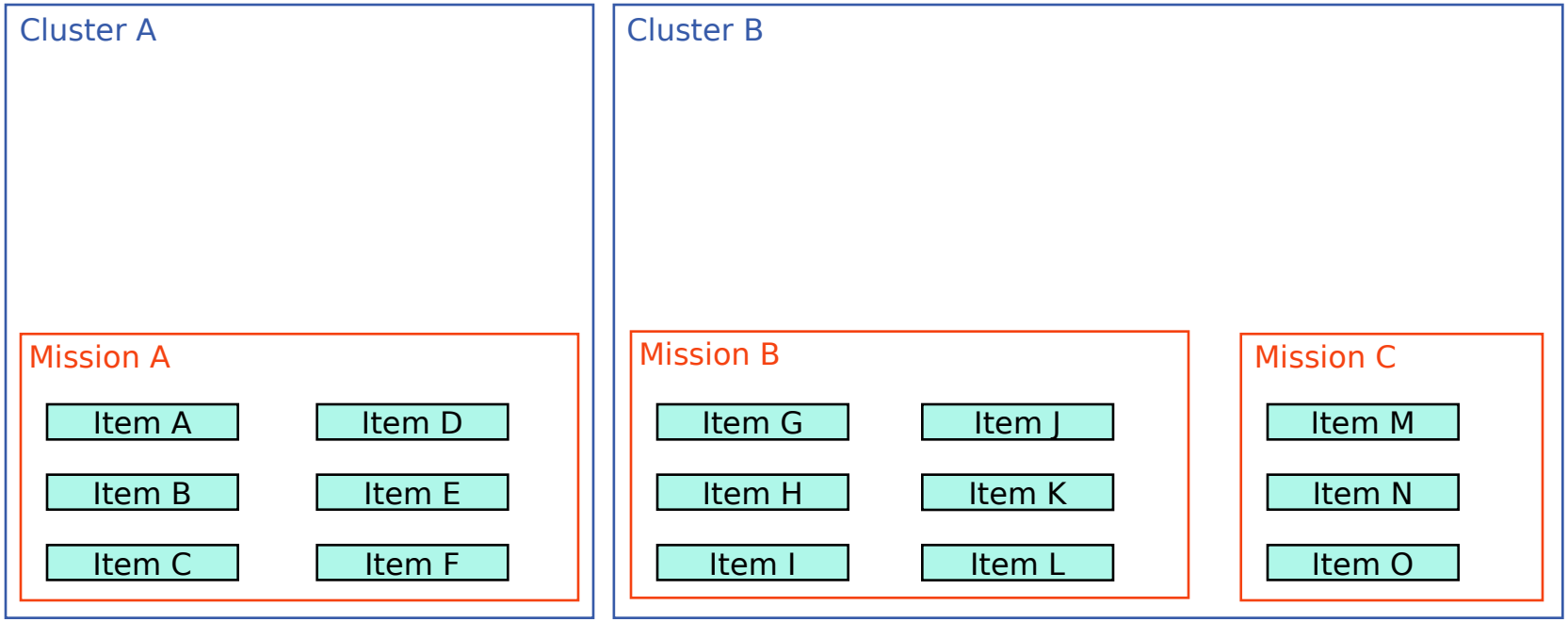
Contents of Attached Documentation:

- Functional comparison of PPS and Logical Decisions
- OR/MS Survey of COTS Decision Analysis Software

Review of PPS Model Structure

KPMG Consulting

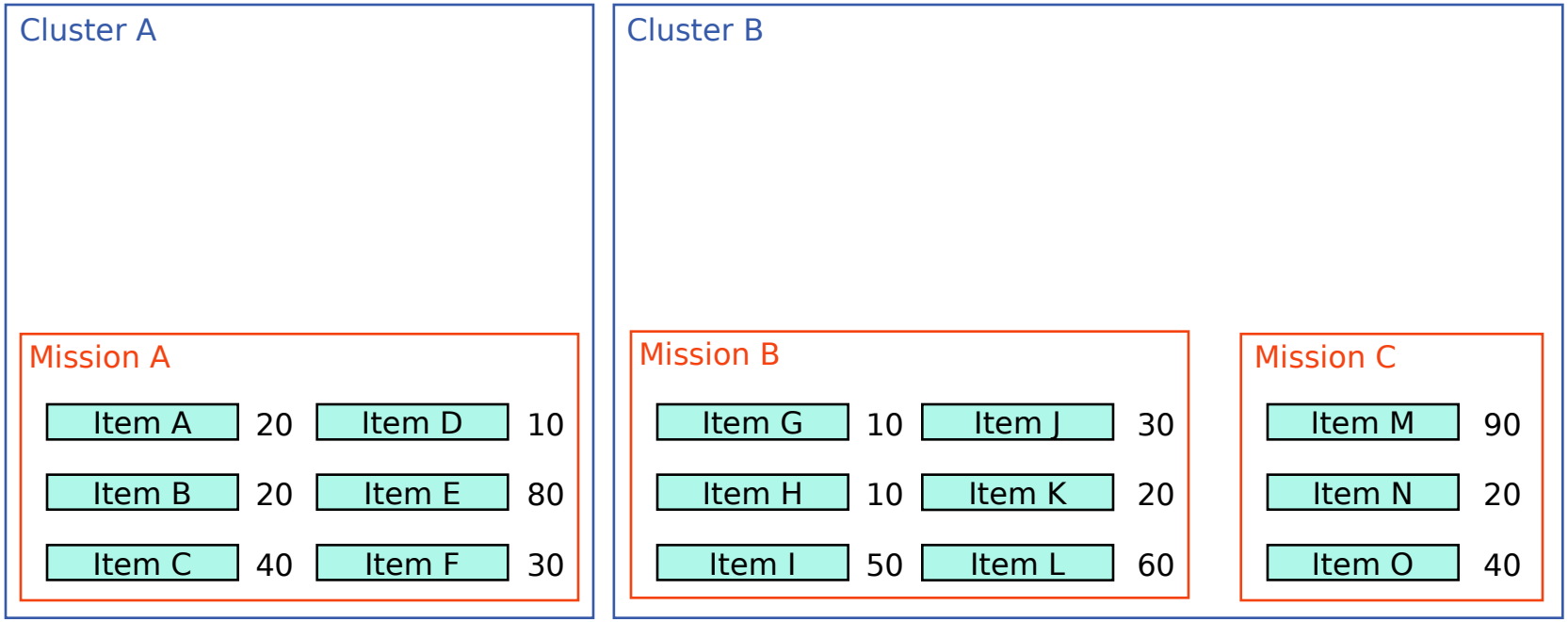
Items are grouped into Missions and Clusters.



Review of PPS Model Structure

KPMG Consulting

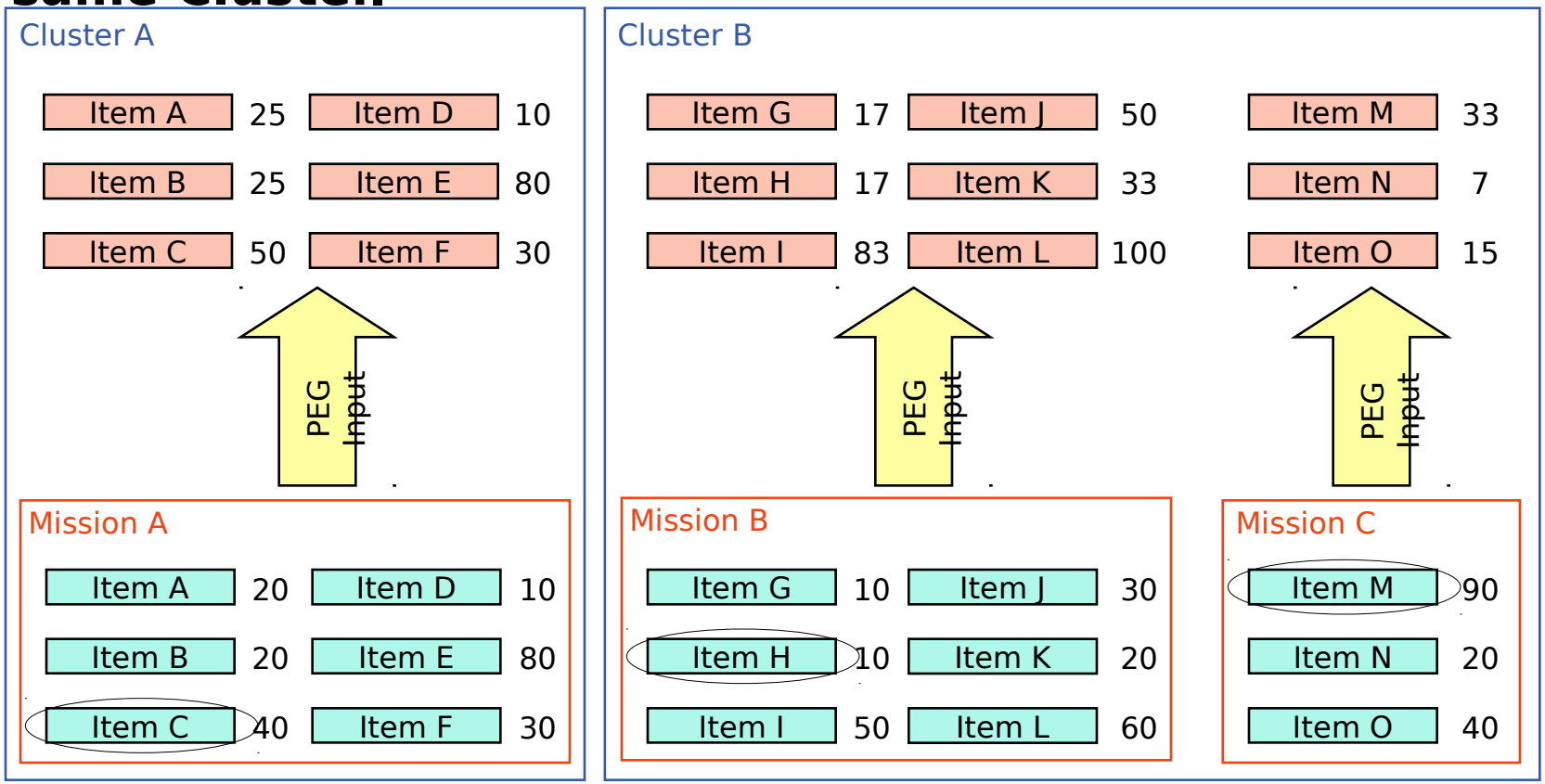
Users assign tradeoff values (“benefits”) to each alternative. These numbers determine the relative importance of each alternative within the same Mission area.



Review of PPS Model Structure

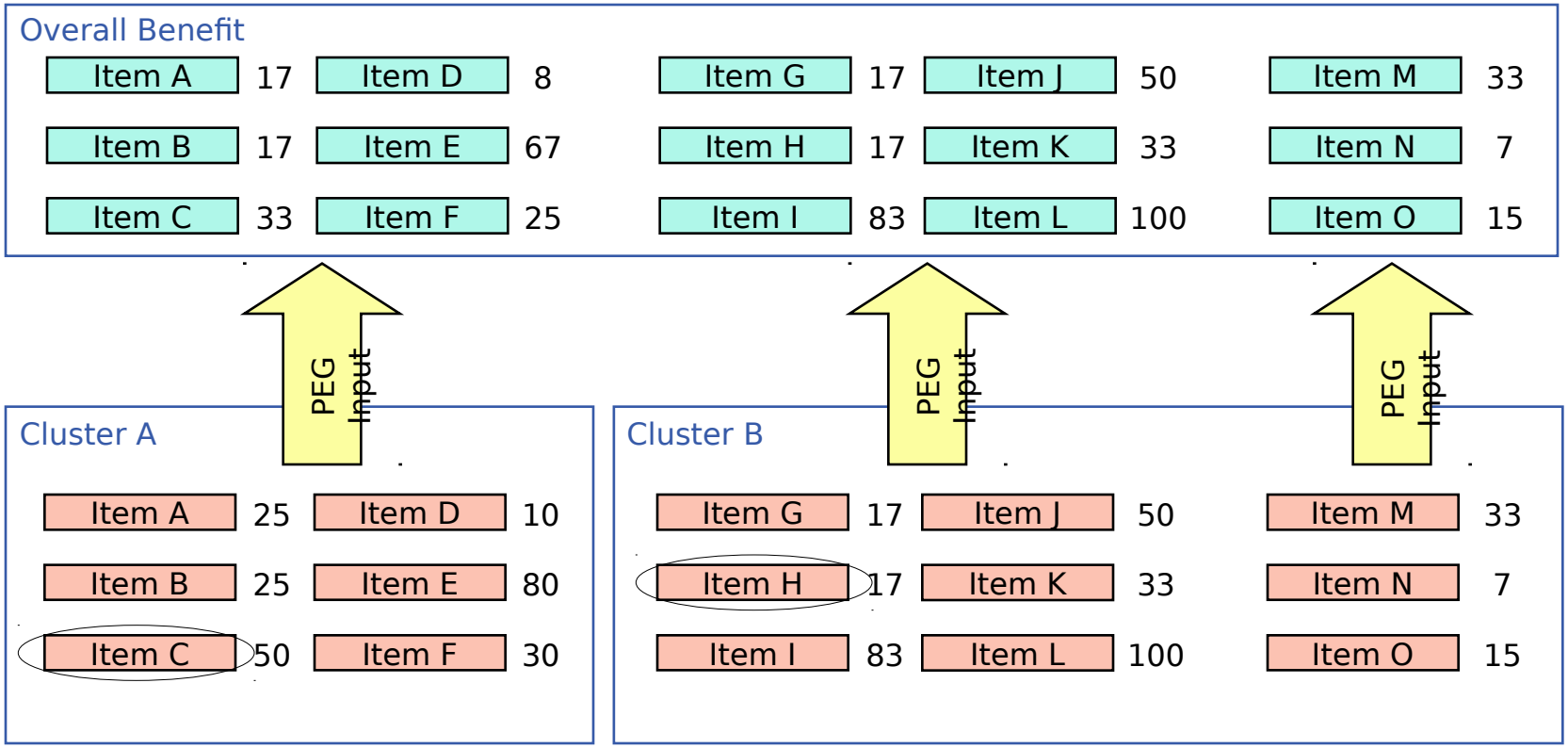
KPMG Consulting

A combination of Mission benefits and PEG input is used to determine relative importance within the same Cluster.



Review of PPS Model Structure

KPMG Consulting


Overall Benefit
Item A 17 Item D 8
Item B 17 Item E 67
Item C 33 Item F 25
Item G 17 Item J 50
Item H 17 Item K 33
Item I 83 Item L 100
Item M 33
Item N 7
Item O 15
PEG Input
PEG Input
PEG Input
Cluster A
Item A 25 Item D 10
Item B 25 Item E 80
Item C 50 Item F 30
Cluster B
Item G 17 Item J 50
Item H 17 Item K 33
Item I 83 Item L 100
Item M 33
Item N 7
Item O 15

A combination of Cluster benefits and PEG input is used to determine the overarching importance of each alternative.

Review of PPS Model Structure

KPMG Consulting

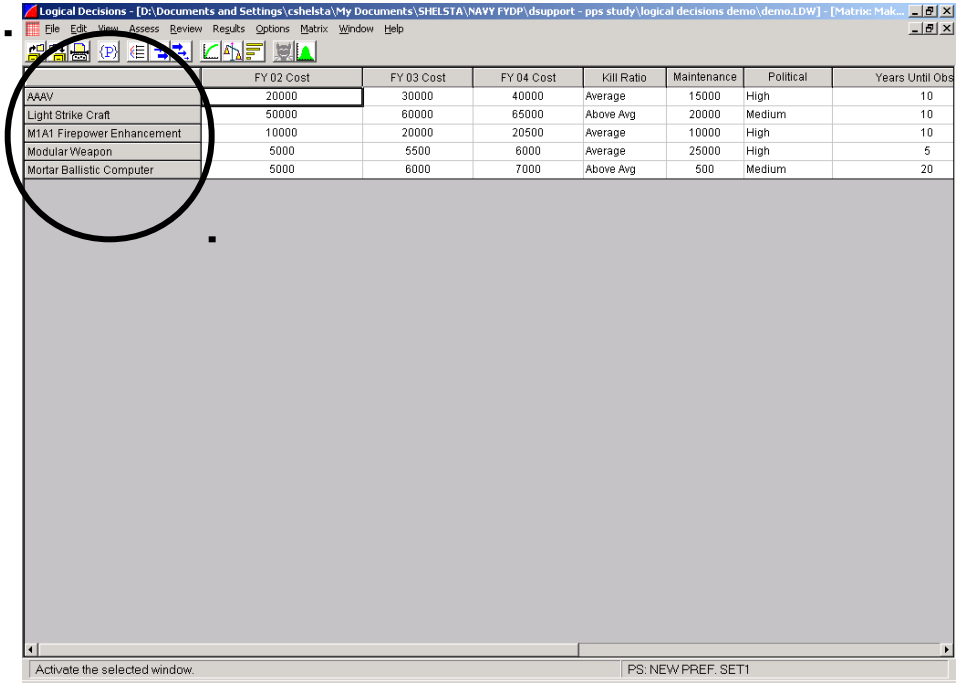
- PPS Output
  - The “Build-the-Plan” Worksheet
    - Displays all items in order of buy, and their benefits and cost controls for each time period
    - Can show running totals and where they exceed constraints
    - Is interactive and dynamic, allowing user to change order of buy, cost controls, and benefits, and see the results
    - Can be printed as a report

Logical Decisions Model Structure

KPMG Consulting

- Alternatives are the choices being ranked. Alternatives consist of a name, ID number, and a level (score) for each measure. Alternatives can be manually entered or imported from other file formats (i.e. dbase, text delimited, Excel)

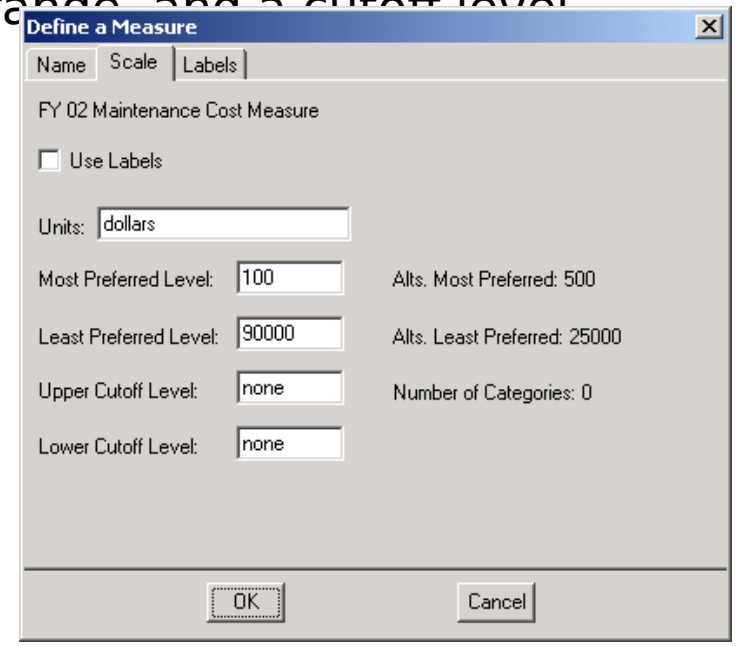
Logical Decisions Alternatives Matrix


Logical Decisions - [D:\Documents and Settings\cshelsta\My Documents\SHELSTA\NAVY FYDP\dsupport - pps study\logical decisions demo\demo.LDW] - [Matrix: Mak...
File Edit View Assess Review Results Options Matrix Window Help
FY 02 Cost
FY 03 Cost
FY 04 Cost
Kill Ratio
Maintenance
Political
Years Until Obs
AAAV 20000 30000 40000 Average 15000 High 10
Light Strike Craft 50000 60000 65000 Above Avg 20000 Medium 10
M1A1 Firepower Enhancement 10000 20000 20500 Average 10000 High 10
Modular Weapon 5000 5500 6000 Average 25000 High 5
Mortar Ballistic Computer 5000 6000 7000 Above Avg 500 Medium 20
Activate the selected window.
PS: NEW PREF. SET1

Logical Decisions Model Structure

KPMG Consulting

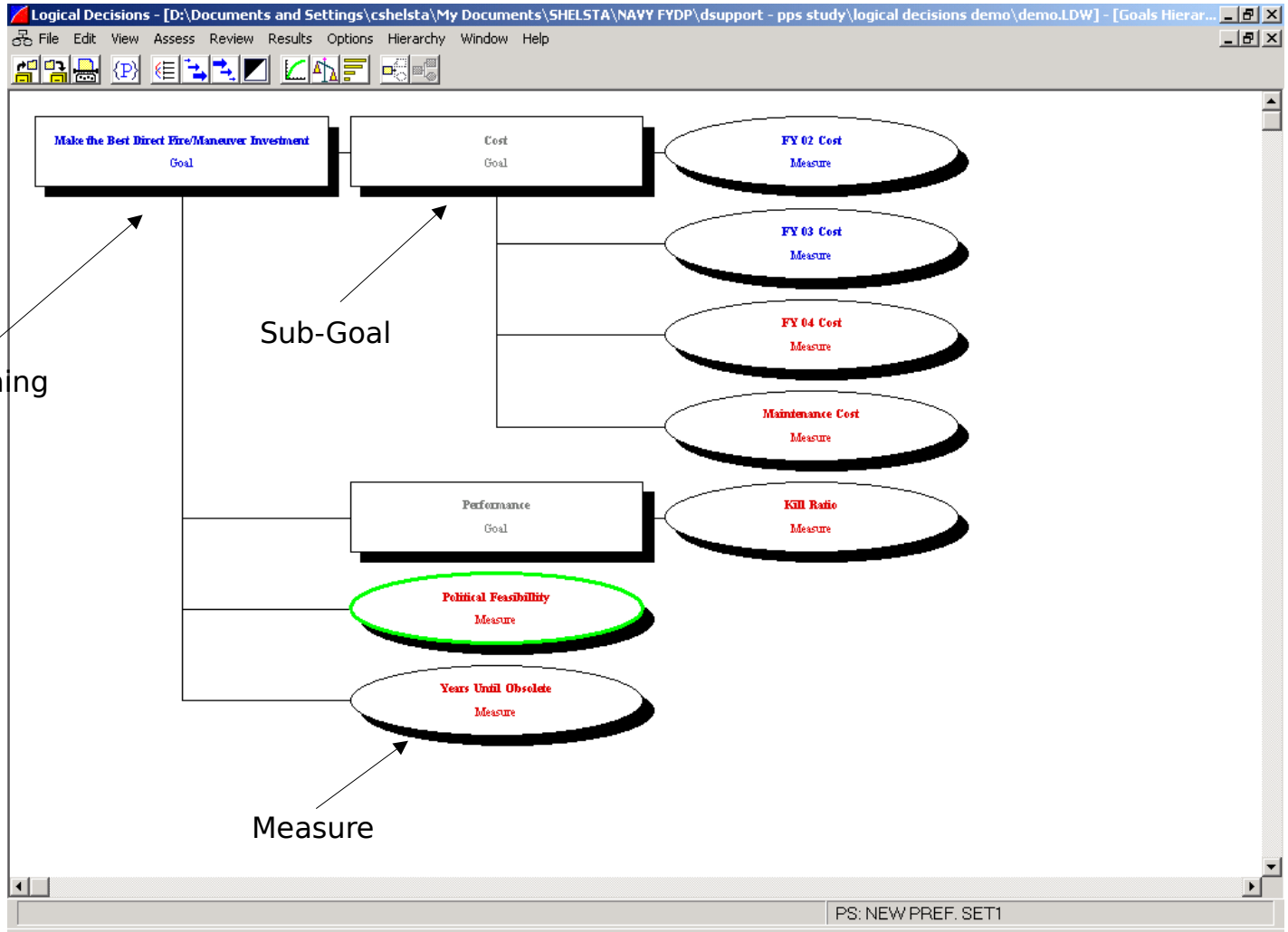
- Measures are numerical or textual variables that capture some quality of the alternatives (e.g. maintenance cost, years until obsolete, political feasibility). Measures consist of a name, ID number, units, a range, and a cutoff level



- Goals are a set of measures and other goals. Goals are arranged in a hierarchy ranging from the most to least general

Logical Decisions Model Structure

KPMG Consulting



Overarching Goal

Sub-Goal

Measure

Logical Decisions Model Structure

KPMG Consulting

- The relative weight of measures impacts the final ranking of alternatives (rankings are derived from the weighted average of measure scores). The following methods can be used to determine weights of measures:
  - "Direct Entry" Method
  - "Tradeoff" Method
  - "Pairwise Weight Ratios" Method
  - "Smart" Method
  - "Smarter" Method
- Note: Measure weights, as well as the function chosen to convert measure levels to common units, can be stored in Preference Sets. The impact of different preference sets on the final ranking can then be viewed.

Logical Decisions Model Structure

KPMG Consulting

- Logical Decisions converts measure scores into common units that can be compared.
  - Each measure's most preferred level is converted to a value of 1
  - Each measure’s least preferred level is converted to a value of 0.
  - Conversion to *intermediate* levels (between 0 and 1) can be customized by the user.
    - Note: In some cases a straight-line conversion is appropriate, in other cases, it is not.

High-Level Process Comparison: PPS vs. Logical Decisions

KPMG Consulting

Step#	PPS Step	Logical Decisions Comparable Step	Details
1	Identify alternatives and group into missions & clusters	Identify alternatives.	One purpose of the PPS hierarchy is to align the comparison of alternatives within mission categories, and in turn, higher level cluster and overall benefit. While Logical Decisions does not support the hierarchical organization of alternatives, it hierarchical organization of goals and measures (and sub-goals) can yield a similar comparison.
2	Define the types of resources (e.g. "dollars," "labor hours")	Develop cost measures.	Logical Decisions does not have a built-in "cost" field. Such fields must be developed as measures against which alternatives are evaluated.
3	Define Time Periods (i.e. Fiscal Years)	Name cost measures to reflect time periods.	This is the only way to emulate the seven year forecast available in PPS. However, it Logical Decisions does not have a "slip" function comparable to PPS.
4	Quantify importance ("benefit") of alternatives relative to others in the same mission.	Enter alternative scores against measures, and define the functions for converting measure scores into common units.	The relative importance of alternatives in Logical Decisions is indirectly dependant on a variety of factors, but is not determined by direct user input. Rather, alternatives are ranked based on their scores across various measures, the relative importance of those measures, and how those measures align with goals and sub-goals.

(Continued on next slide.)

High-Level Process Comparison: PPS vs. Logical Decisions

KPMG Consulting

Step#	PPS Step	Logical Decisions Comparable Step	Details
5	Identify representative alternatives for each mission, assign PEG benefits, and use them to scale benefits to the cluster level.	N/A	Logical Decisions cannot accommodate the cluster-mission-alternative hierarchy of alternatives. But this does not preclude PEG input.
6	View cluster benefits and mission benefits of each alternative.	N/A	Viewing of utility scores in Logical Decisions can be viewed against goals and measures, but not in an iterative fashion (i.e. from one stage of calculation to another).
7	Identify representative alternatives for each cluster, assign PEG benefits, and use them to scale to an overarching level.	N/A	Logical Decisions cannot accommodate the cluster-mission-alternative hierarchy of alternatives. But this does not preclude PEG input.

(Continued on next slide.)

High-Level Process Comparison: PPS vs. Logical Decisions

KPMG Consulting

Step#	PPS Step	Logical Decisions Comparable Step	Details
8	View overall, cluster, and mission benefits for each alt.	N/A	Viewing of utility scores in Logical Decisions can be viewed against goals and measures, but not in an iterative fashion (i.e. from one stage of calculation to another).
9	Enter estimated costs	Enter levels for cost measures.	Costs can be entered as "levels" against cost measures for each fiscal year.
10	Enter fiscal guidance	N/A	An overall limit on total funding cannot be established in Logical Decisions. At best, cutoff levels for individual alternatives can be established.
11	Initialize cost controls	Specify cutoff levels for cost measures.	Minimum and maximum levels can be specified for each measure in Logical Decisions. Alternatives that don't fall into the range are automatically dropped.
12	Initialize priorities of alternatives	Rank alternatives.	PPS prioritizes alternatives based on benefit-to-cost ratio. Logical decisions ranks alternatives based on their scores against measures. Logical decisions does not allow calculated measures, so any cost-benefit analysis would have to be done off-line.
13	Make funding decisions	N/A	Unlike PPS, Logical Decisions does not keep alternatives that have exceeded cost controls. Thus, there is no opportunity to keep such alternatives by reducing their costs or slipping them to another fiscal year. Even if Logical decisions did not discard such alternatives, it does not have a slip function.